

REMARKS

Claims 23-53 are currently pending in this application. Original PCT claims 1-23 and amended PCT claims 1-22 were cancelled and claims 24-47 (renumbered as claims 23-46 by the Examiner) were added by a Preliminary Amendment. Claims 47-53 were added in a previous Amendment dated September 30, 2003. This Amendment cancels claims 51-53, amends claims 23-25, 31, 33, 35 and 42, and adds new claims 54-71. Support for the amendments to the specification, the claims and the new claims can be found in the specification, drawings and claims as originally filed. No new matter has been added.

The specification has been amended to include language that is consistent with the language recited in the claims.

The Examiner has objected to the drawings under 37 C.F.R. § 1.83(a) for failing to show every feature of the invention as specified in the claims. The Examiner asserts that the language "resilient holder is arranged around at least a part of the housing" recited in the claims is not shown in the drawings. Applicants respectfully disagree with the Examiner's assertion.

The resilient holder arranged around at least a part of the housing is shown as numeral 6 in Fig. 2. Referring to Figs. 1 and 2, the housing represented by reference numerals 1, 2, 3, 4 and 8 is provided with a protective holder 6, preferably manufactured from a resilient material such as an elastic plastic, rubber or the like (page 9, lines 28-35 of the present specification). Because the resilient holder 6 is shown in Fig. 2, withdrawal of this objection is respectfully requested.

The Examiner has rejected claim 51 under 35 U.S.C. § 112, second paragraph, for indefiniteness. Claim 51 has been cancelled and, therefore, the rejection of claim 51 is moot.

The present invention, as claimed in amended independent claim 23, is directed to a device for scanning and/or recognizing one or more barcodes. The device includes a laser light source for transmitting a laser light beam, a control means for switching the laser light source on and off, a rotatable polygonal mirror for reflecting the transmitted laser light beam, a number of mirrors for reflecting the laser light beam, wherein the mirrors are disposed in stationary operative positions and aligned side by side along a substantially circumferential direction, a pick-up element for picking up laser light scattered by a barcode, and a compact housing to be hand held in which a laser light source, the polygonal mirror, the

mirrors, and the pick-up element are arranged. The housing comprises a bottom side which is substantially flat for placement of the housing itself. The device is to be used alternatively in a hand held mode and a fixed mode. A fixed mode scan pattern or a hand mode scan pattern is cast through one and the same window in the housing after reflection of the laser light beam on at least one of the number of mirrors. The control means switches the laser light source on or off such that, depending on the switching on and off, the laser light beam selectively falls on at least one of the number of mirrors, thereby generating the hand mode scan pattern or the fixed mode scan pattern.

The Examiner has rejected claims 23, 24, 31, 32, 43, 46-49 and 51-53 under 35 U.S.C. § 103(a) for obviousness over British Published Patent Application No. GB 2 345 370 A to Tamburrini et al. (hereinafter "the Tamburrini reference") in view of U. S. Patent No. 5,504,316 to Bridgelall et al. (hereinafter "the Bridgelall patent"). The Examiner asserts that the Tamburrini reference teaches the claimed invention except for (1) a fixed mode scan pattern or a hand mode scan pattern cast through the standing front wall; (2) both scan patterns being cast through one in the same window 38 in the housing; and (3) a resilient holder arranged around at least part of the housing. The Examiner asserts that the Bridgelall patent teaches a fixed mode or a hand mode scan pattern being cast through one in the same window in the housing, and a resilient holder arranged around at least part of the housing. Therefore, the Examiner contends that it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to incorporate the teachings of the Bridgelall patent into the teachings of the Tamburrini reference in order to provide a more feasible, compact and accurate system.

In response, claims 51-53 have been cancelled and, therefore, the rejection of claims 51-53 is moot. Independent claim 23 has been amended to include the following limitations. First, the device further comprises a "control means for switching the laser light source on and off." Support for this limitation is found, for example, on page 3, lines 10-25 and page 12, lines 8-10 of the present specification, and in claim 24 prior to being amended. Second, the device includes the limitation wherein the number of mirrors are "disposed in stationary operative positions and align side by side along a substantially circumferential direction." Support for the amended language is found, for example, in Figs. 3-5 (i.e., reference numerals 19-21) of the drawings and in the amended specification at page 10. Third, the limitation wherein the fixed mode scan pattern and the hand mode scan pattern are

cast "after reflection of said laser light beam on at least one of said number of mirrors" is supported in the specification on page 3, lines 7-13 and page 11, lines 33-36. Finally, the limitation "wherein the control means switches the laser light source on or off such that, depending on the switching on and off, the laser light beam selectively falls on at least one of said number of mirrors, thereby generating said hand mode scan pattern or said fixed mode scan pattern" finds support, for example, on page 3, lines 3-16 and page 11, line 33 to page 12, line 2 of the present specification. Claim 24 has been amended to specify that the position determining means determines a position of the laser light beam falling onto the mirrors. Support for the amendment to claim 24 can be found, for example, on page 3, lines 26-29 and page 12, lines 2-4 of the present specification. Claim 31 has been amended to include the language that the sensor means detects laser light reflected from the polygonal mirror "towards at least one of said mirrors." Support for this amended language can be found, for example, in Figs. 3 and 5 of the drawings and in the specification on page 3, lines 10-13 and page 10, lines 19-22. In view of the amendments to independent claim 23, claims 23, 24, 31, 32, 43 and 46-49 are believed to be distinguishable over the Tamburrini reference and the Bridgelall patent for the reasons discussed below.

The Tamburrini reference is directed to a barcode reading device that can operate in a fixed mode and a portable mode. The device includes a laser light source 550 for transmitting a scanning beam 556 (page 21, lines 29-31), a rotatable mirrored polygon for reflecting laser light (Figs. 16-17 and page 21, lines 15-17), a number of fixedly disposed pattern mirrors for reflecting laser light (page 22, lines 1-2), a pick-up element for picking up the laser light scattered by a barcode (page 23, lines 8-12) and a compact housing (Figs. 1, 3-10, 13, 14 and 19). The housing has two distinct scan windows 104 and 108 (Fig. 1), one for the hand mode operation and another for the fixed mode operation, for casting two respective laser light scan patterns. Referring to Fig. 12, the device also comprises a fold mirror 273 which redirects laser light coming from a laser light source or a laser diode 255 onto the rotatable mirrored polygon or facet wheel 250 (page 16, lines 12-14).

The Bridgelall patent is directed to a scanner that is operable in both portable (hand held) and surface mounted (hands free) modes for reading various types of indicia (column 1, lines 30-33). The scanner comprises a means for determining whether the operation is in a fixed or portable mode, and a means for adapting the scan pattern to an optimized pattern for such mode of operation (column 4, lines 25-30). The scanner 30 is

housed in a light-weight plastic housing 40 and can be held in the palm of a user's hand (column 8, lines 39-43). The scanner 30 can also be mounted in a bracket 114 when operating in a fixed mode (Fig. 20A). Figs. 1B and 20A show the scanner 30 having one window, wherein both a fixed mode scan pattern and a hand held mode scan pattern are cast through.

None of the prior art of record teaches or suggests the use of a number of mirrors disposed in stationary operative positions and aligned side by side along a substantially circumferential direction for reflecting both the fixed mode scan pattern and the hand mode scan pattern by switching on and off a laser light source, such that the generated laser light beam falls selectively on at least one of the number of mirrors as claimed in amended independent claim 23. In the Tamburrini reference, the scanning device includes two scan windows (i.e., 104 and 108 shown in Fig. 1; 304 and 308 shown in Figs. 3-5) wherein the device uses different optical elements for generating different scan patterns. As shown in Figs. 16 and 17, as the facet wheel 558 rotates, scanning beam 556 reflected from any one facet mirror may be sequentially swept across one or more of the pattern mirrors 564, 565, 566, 580, 581, 582 and 583. As scanning beam 556 is swept across any of the pattern mirrors, a scan line is reflected through scan window 508 shown in Fig. 14. When the scanning beam 556 is directed through scan window 514, the reflected beam off of the facet wheel 558 misses the pattern mirrors 564, 565, 566, 580, 581, 582 and 583. (See page 21, line 34 to page 22, line 13 of the Tamburrini reference). In other words, an isolated single mirror 568 is used to generate a first scan pattern which is separate from the number of pattern mirrors used to generate a second scan pattern. Therefore, the Tamburrini reference does not teach or suggest the use of a number of pattern mirrors for reflecting both fixed mode and hand mode scan patterns.

Although the Bridgelall patent discloses a scanner that can project different patterns through one window, the generation of the different scan patterns is accomplished by the use of oscillating mirrors 110 (Fig. 17 and column 15, lines 54-57). Therefore, the scanner uses optic elements that are not stationary in operation for generating the different scan patterns as claimed in amended independent claim 23. Furthermore, the Bridgelall patent does not teach or suggest a means for switching on and off of a light source. In view of the above amendments to independent claim 23, claim 23 is believed to be patentable over the Tamburrini reference and the Bridgelall patent and in condition for allowance. Claims

24, 31, 32, 43 and 46-49 depend either directly or indirectly from amended independent claim 23 and are likewise in condition for allowance. Accordingly, withdrawal of the rejection and allowance of claims 23, 24, 31, 32, 43 and 46-49 are respectfully requested.

The Examiner has rejected claims 25-28, 33, 34, 44 and 50 under 35 U.S.C. § 103(a) for obviousness over the Tamburrini reference in view of the Bridgelall patent and further in view of U. S. Patent No. 4,816,661 to Krichever et al. (hereinafter "the Krichever patent") for the reasons discussed in Item 7, pages 5 and 6 of the Office Action. The Examiner has combined the Krichever patent with the Tamburrini reference and the Bridgelall patent and asserts that the Krichever patent teaches a folding mirror 186 that is foldable around a shaft 174. The Examiner contends that it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to incorporate a foldable mirror as taught by the Krichever patent into the teaching of the Tamburrini reference and the Bridgelall patent in order to enhance the deflective capabilities of the scanning system, and to provide a more feasible and compact system. Applicants respectfully traverse the rejection of these claims.

Independent claim 33 has been amended to specify that the foldable mirror is foldable between two stationary operative positions. Support for the amendment to independent claim 33 can be found, for example, in Figs. 3 and 5 of the drawings and in the amended specification at page 12.

The Tamburrini reference and the Bridgelall patent have been discussed above. The Krichever patent is directed to multiple scan line pattern generators for generating multiple scan lines in a laser scanning system. Figs. 1-6 identify an arrangement 10 that includes a housing 12 containing a laser source 16 and a scan pattern generator 120, wherein the laser source 16 directs a laser beam through an optical lens 122 for directing the beam onto a rotary main mirror 124. The rotary main mirror 124 is mounted onto a vertical shaft 126 which is rotated by a motor drive 128 about a vertical axis (Fig. 1 and column 4, lines 4-25). Because mirror 124 is continuously rotating, mirror 124 is not stationary while in operation. Figs. 7-9 of the Krichever patent show a scan pattern generator 170 that includes a center mirror 176 mounted on a rotating shaft 174. An overhead folding mirror 186 is used to direct a laser beam emitted from the laser source 16 to the center mirror 176 (column 6, lines 9-18). The folding mirror 186 is supported by the housing 12 (column 6, lines 46-48). Because folding mirror 186 is fixed in only one position, mirror 186 is not foldable between

two operative positions. In view of the foregoing, the Krichever patent does not teach or suggest a mirror foldable between two stationary operative positions, in the first position of which a first mirror front surface reflects laser light incident thereon, and in the second position of which a second mirror rear surface reflects laser light incident thereon as claimed in amended independent claim 33.

There is no teaching, suggestion or motivation in the Tamburrini reference, the Bridgelall patent, or the Krichever patent to provide a mirror foldable between two stationary operative positions, reflecting light on both a front surface and a rear surface of the mirror. Therefore, claim 33 is believed to be distinguishable over these references. Because claims 34 and 44 depend from amended independent claim 33, they are believed to be distinguishable over the cited prior art for the same reasons discussed above. With regard to dependent claims 25-28 and 50, which depend either directly or indirectly from amended independent claim 23, they are believed to be allowable for the same reasons as discussed above in connection with amended independent claim 23. In view of the foregoing, withdrawal of the obviousness rejection and allowance of claims 25-28, 33, 34, 44 and 50 are respectfully requested.

The Examiner has rejected claims 29 and 30 under 35 U.S.C. § 103(a) for obviousness over the Tamburrini reference as modified by the Bridgelall patent and further in view of U. S. Patent No. 4,958,894 to Khowles. The Examiner cites the Khowles patent for the teaching of a coil in a bumper, wherein the coil serves as a means for oscillating the mirror about an axis, and the bumper serves as a blocking means for keeping the mirror in position. Because claims 29 and 30 depend either directly or indirectly from amended independent claim 23, they are believed to be allowable for the same reasons as discussed above in connection with amended independent claim 23.

The Examiner has rejected claims 35, 36, 38-42 and 45 under 35 U.S.C. §103(a) for obviousness over the Tamburrini reference as modified by the Bridgelall patent and further in view of U. S. Patent No. 5,175,421 to Harris (hereinafter "the Harris patent") for the reasons discussed in Item 9, pages 7 and 8 of the Office Action. The Examiner cites the Harris patent for the asserted teaching of a deflector assembly 52 which includes a polygonal mirror having its outer ends placed on a rotating support member. Therefore, the Examiner contends that it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to incorporate the teachings of the Harris patent into the

system as taught by the Tamburrini reference and the Bridgelall patent in order to provide for a better arrangement of the components within the apparatus. In response, independent claim 35 has been amended to include the limitation that the rotatable polygonal mirror “comprises a plurality of flat mirror surfaces defining a lateral surface which is closed around an axis of rotation of said polygonal mirror.” Support for the amendments to independent claim 35 can be found, for example, in Figs. 7 and 8, page 10, lines 6-13, and page 14, lines 22-37 of the present specification. In view of the amendment to independent claim 35, claim 35 is believed to be distinguishable over the Tamburrini reference, the Bridgelall patent and the Harris patent for the reasons discussed below.

The Tamburrini reference and the Bridgelall patent have been discussed above. The Harris patent is directed to an optical code scanner that uses an asymmetrical deflector which deflects a scanner beam along different paths within the scanner. The asymmetrical deflector includes a disk or support member 55 and a plurality of deflecting members 62, 60, 58 and 56 mounted around a portion of the periphery of the support member 55. The support member 55 and the deflecting members are mounted via opening 61 to a shaft 63 of drive motor 19 (Figs. 3 and 4 and column 4, lines 17-27). Each one of the deflecting members 62, 60, 58 and 56 comprises a front mirror and back mirror which reflect the beam from two different deflection points, thereby generating different path lengths for the beam (Figs. 3 and 4 and column 4, lines 39-62). As discussed in detail below, the Harris patent does not teach or suggest a polygonal mirror comprising a plurality of flat mirror surfaces defining a lateral surface which is closed around an axis of rotation, or a polygonal mirror having its outer ends placed on a rotating support member as claimed in amended independent claim 35.

According to Webster's New College Dictionary, a polygon is defined as a closed plane figure bounded by three or more line segments. The Harris patent does not disclose a polygonal mirror, but a plurality of mirror segments mounted on a rotating support member. These mirror segments are not closed around an axis of rotation. Furthermore, because Harris does not disclose a polygonal mirror, it does not have outer ends to place on a support member. In view of the amendment to independent claim 35, the Tamburrini reference, the Bridgelall patent and the Harris patent, either alone or in combination, do not teach or suggest a polygonal mirror comprising a plurality of flat mirror surfaces defining a lateral surface which is closed around an axis of rotation, or a polygonal mirror having its

outer ends placed on a rotating support member. Therefore, amended claim 35 is believed to be distinguishable over these references. Because the claims 36, 38-42 and 45 depend either directly or indirectly from amended independent claim 35, they are believed to be distinguishable over the Tamburrini reference, the Bridgelall patent and the Harris patent for the reasons discussed above. In view of the above, withdrawal of the obviousness objection and allowance of claims 35, 36, 38-42 and 45 are respectfully requested.

The Examiner has rejected claim 37 under 35 U.S.C. §103(a) for obviousness over the Tamburrini reference as modified by the Bridgelall patent and the Harris patent and further in view of U. S. Patent No. 5,629,510 to Quinn et al. (hereinafter "the Quinn patent"). The Examiner cites the Quinn patent for the teaching of a parabolic mirror 20 affixed to a rotating support member/rotor body 22 by adhesive surface 62. Because claim 37 depends from amended independent claim 35, claim 37 is believed to be allowable for the same reasons discussed above in connection with amended independent claim 35.

NEW CLAIMS

New claims 54-71 have been added. Support for new claims 54-71 can be found in the specification, drawings, and claims as originally filed.

New claim 54 depends from claim 23 and includes the limitation that at least one of said number of mirrors has a concave reflective surface. Support for new claim 54 can be found, for example, in Figs. 5 and 6, page 4, lines 12-17 and page 12, lines 21-24 of the present specification. New claim 55 depends from claim 23 and includes the limitation that the housing is completely constructed from the bottom side, which is substantially flat for placement of the housing, a top side, a standing rear wall, a standing front wall and two standing side walls arranged therebetween, wherein the window is defined on the standing front wall. Support for new claim 55 can be found in independent claim 23 prior to being amended. New claim 56 depends from claim 31 and includes the limitation that the sensor means is disposed in the vicinity of at least one mirror, detecting a passage of the laser beam and the point in time at which it occurs. Support for new claim 56 can be found in Figs. 3 and 5 (reference numeral 60) of the drawings. Because new claims 54-56 depend either directly or indirectly from amended independent claim 23, they are believed to be allowable for the same reasons discussed above in connection with amended independent claim 23.

New independent claim 57 is similar to independent claim 23, except that the language "the housing comprises a bottom side which is substantially flat for placement of

the housing itself' is not recited in new claim 57. Therefore, new claim 57 is believed to be allowable for the same reasons discussed above in connection with amended independent claim 23.

New claim 58 depends from claim 57 and includes the same limitations found in new claim 54. New claim 59 depends from claim 57 and includes the same limitations found in amended claim 24. New claim 60 depends from claim 59 and includes the same limitations found in amended claim 31. New claim 61 depends from claim 60 and includes the same limitations found in claim 56. Because new claims 58-61 depend either directly or indirectly from independent claim 57, claims 58-61 are believed to be allowable for the same reasons discussed above in connection with new claim 57.

New independent claim 62 is similar to new claim 57, except that the limitation wherein the control means switches the laser light source on or off "such that, depending on the switching on and off, the laser light beam selectively falls on at least one of said mirrors" is not recited in new claim 62. Claim 63 depends from claim 62 and includes the same limitations found in new claim 55. Therefore, new claims 62 and 63 are believed to be allowable for the same reasons discussed above in connection with amended claim 23 and new claim 57.

New independent claim 64 is similar to amended independent claim 23, except that the limitation of the control means limitation for switching the laser light source on and off has been deleted from claim 64. New claim 64 further includes the limitation wherein the device comprises "a removable protective resilient holder which is arranged at least partially over said bottom side, top side, standing rear wall, standing front wall and standing side walls." Support for this limitation can be found, for example, in Fig. 2 and on page 9, lines 28-37 of the present specification. Therefore, new claim 64 is believed to be allowable for the same reasons discussed above in connection with amended independent claim 23. New claim 65 depends from claim 64 and is allowable for the same reasons claim 64 is allowable. Support for new claim 65 can be found, for example, on page 9, lines 32-37 of the present specification.

New claim 66 depends from claim 35 and includes one of the limitations found in amended independent claim 23. New claim 67 depends from claim 35 and includes some of the limitations found in amended independent claim 23. New claim 68 depends from claim 67 and includes the limitations found in amended claim 24. New claim 69 depends

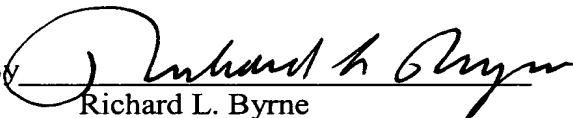
from claim 68 and includes the limitations found in amended claim 31. New claim 70 depends from claim 69 and includes the limitation found in new claim 56. New claim 71 depends from claim 36 and includes the limitation "wherein the polygonal mirror and the rotating support member are non-integrally affixed to each other." Support for new claim 71 can be found, for example, in Figs. 3 and 5 of the drawings and in the amended specification at page 10. Because claims 66-71 depend either directly or indirectly from amended independent claim 35, they are believed to be allowable for the same reasons discussed above in connection with claim 35.

CONCLUSION

In view of the above amendments to claims 23-25, 31, 33, 35 and 42, and remarks, withdrawal of the rejection of the claims and allowance of claims 23-50 and new claims 54-71 are respectfully requested.

Respectfully submitted,

WEBB ZIESENHEIM LOGSDON
ORKIN & HANSON, P.C.

By 

Richard L. Byrne
Registration No. 28,498
Attorney for Applicants
700 Koppers Building
436 Seventh Avenue
Pittsburgh, PA 15219-1818
Telephone: 412-471-8815
Facsimile: 412-471-4094
E-mail: webblaw@webblaw.com